Transactions of the Canadian Society for Mechanical Engineering
Volume 28, Issue (3-4), Pages 415-429

Computer-aided Design of Rollers with Straightening Bars

Yang, Shyue-Cheng

Abstract

In this paper, a method by applying gear theory to determine the mathematical model of a bar-straightening roller has been presented. Based on the gear theory, the contour of a roller is the envelope to two parameter family of roller surfaces. In this work, two types of the contact lines on the roller surface were developed and verified. It is found that one of the present types is able to generate the straight instantaneous contact line which is generally advantage for manufacturing. The surface analysis including contact lines are used to design and manufacture a roller. The principal curvatures of the roller are used to avoid undercutting of the roller. The required cutting path is used to obtain NC turning process. A software package is used to assembly of rolls and straightened bars. The straightened bars become straightening along the contact lines of roller.